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SPECIFICATION FOR WAX-COATED PAPER SPLINTS

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 1981

AMENDMENT NO. 1 OCTOBER 2000
TO
IS 9880 : 1981 SPECIFICATION FOR WAX-COATED PAPER SPLINTS

(*Page* 4, *clause* **4.1**) — Substitute the following for the existing matter

'**4.1 Length** — The length of wax-coated paper splints shall be 26 mm, *Min*.'

(*Page* 4, *clause* **4.3**) — Substitute the following for the existing clause:

'**4.3** The wax content in the splints shall be 40 percent minimum when tested according to the method given in Appendix A.'

(CHD 26)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR WAX-COATED PAPER SPLINTS

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(*Continued on page* 2)

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Indian Standard

SPECIFICATION FOR WAX-COATED PAPER SPLINTS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 July 1981, after the draft finalized by the Safety Matches Sectional Committee had been approved by the Consumer Products and Medical Instruments Division Council

0.2 Wax-coated paper splints used in the manufacture of waxed-coated paper safety matches are generally made from waxed paper which has been rolled and compressed in the shape of match splints. Wax-paper splints are used to substitute and supplement wooden match splints in the manufacture of safety matches.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers requirements and methods of sampling and tests for wax-coated paper splints used in the manufacture of safety matches.

2. TERMINOLOGY

2.1 Basis Substance (Grammage) — The substance (grammage) of a specified area of paper determined under standard test conditions It is usually expressed in grams per square metre.

2.2 Wax-Coated Paper Splint — A match splint made out of paper by waxing/rolling and compressing used in the manufacture of match sticks.

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*Rules for rounding off numerical values (*revised*).

2.3 Safety Matches — The safety matches are wooden or wax-coated paper sticks having flammable head that can ignite only when struck on a particularly prepared friction surface.

NOTE — The match sticks have flammable head of chemicals whereas the splints do not have.

3. MATERIAL

3.1 Base Paper — The base paper used shall be free from mechanical pulp. The substance (grammage) of the paper shall be between 40 and 60 g/m^2 when tested in accordance with the method given in IS : 1060 (Part I)-1966*.

3.2 Wax — The wax shall conform to IS : 4654-1974†.

4. REQUIREMENTS

4.1 Length — The length of wax-coated paper splints shall be 32 mm, minimum.

4.2 The splints shall be clean, free from surface roughness, straight and shall be made of one piece wax paper.

4.3 The wax content in the splints shall be between 40 and 50 percent when tested according to the method given in Appedix A.

4.4 Strength of the Splints

4.4.1 The bending strength of the splints shall be tested according to the method given in Appendix B.

4.4.2 When the splint is pressed to bend through 180° by holding it between thumb and forefinger, it shall not break into two, instead it shall bend without any sign of cracks on the outer surface of the bend.

4.5 Performance — The splints shall burn with flame for a minimum of thirty seconds.

5. SAMPLING

5.1 Lot

5.1-1 All the wax coated paper splints in a single consignment made from the same material and manufactured in the same unit shall constitute a lot.

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*Method of sampling and test for paper and allied products. Part I (*revised*).

†Specification for paraffin wax (*first revision*).

5.1.2 Samples shall be tested from each lot for ascertaining the conformity of the lot of the requirements of this specification. The number of splints to be selected from a for shall depend upon the size of the lot and shall be in accordance with Table 1.

TABLE 1 SAMPLE SIZE AND ACCEPTANCE NUMBER

(*Clauses* 5.1.2, 5.2 and 5.2.2)

LOT SIZE	FOR FINISH AND DIMENSIONAL REQUIREMENTS		TESTS FOR STRENGTH OF THE SPLINTS AND PERFORMANCE TEXT	
	Sample Size	Acceptance Number	Sample Size	Acceptance Number
(1)	(2)	(3)	(4)	(5)
Up to 10 000	125	7	32	2
10 001 to 35 009	200	10	50	3
35 001 to 150 000	315	14	80	5
150 001 and above	500	21	125	7

5.1.2.1 These splints shall be selected from the lot at random. In order to ensure the randomness of selection, procedures given in IS: 4905-1968* may be followed.

5.2 Number of Teats and Criteria for Conformity

5.2.1 All the splints selected at random according to col 1 and 2 of Table 1 shall be subjected to dimensional and finish requirements A splint failing to satisfy either of the requirement shall be termed as defective. The lot shall be considered as conforming to these requirements if the number of defectives found in the sample is less than or equal to the corresponding acceptance number (*see* col 3 of Table 1), otherwise the lot shall be rejected.

5.2.2 The lot which is found as conformmg to the above requirements shall then be tested for strength of the splints and performance test. For this purpose the sample size and corresponding acceptance number are given in col 4 and 5 of Table 1.

6. PACKING

6.1 The splints may be packed as per agreement between the purchaser and the supplier.

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*Methods for random sampling.

7. MARKING

7.1 The package shall be marked with the length, gross weight of the splints, manufacturer's trade-mark and/or initials.

7.1.1 The splints may also be marked with the ISI Certification Mark.

Note — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under vrhich a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

APPENDIX A

(*Clause* 4.3)

DETERMINATION OF WAX CONTENT

A-1 APPARATUS

A-1.1 Soxblet Extractor

A-2. REAGENTS

A-2.1 Carbon Tetrachloride

A-2.2 Alcoholic Potassium Hydroxide Solution — approximately 0 5 N.

A-2.3 Petroleum Ether — Boiling range 40° — 60°C.

A-3. PROCEDURE

A-3.1 Weigh accurately about 3 g of the paper splints, cut it into strips and fold into numerous small crosswise folds Extract the strips in a Soxhlet extractor with carbon tetrachloride for 4 hours or until the wax is all removed.

A-3.2 Evaporate the extract on a -water-bath to dryness and add 25 ml of alcoholic potassium hydroxide solution and again evaporate to dryness. Cool the residue and take it up with petroleum ether and water and transfer to a separatory funnel. (The volume of petroleum ether in the funnel should be about 25 ml and that of water 150 ml. The water should contain a smalt amount of sodium chloride to prevent emulsification.) Shake the contents of the funnel thoroughly and then allow the two layer to separate completely. Draw off the water layer into a second separatory funnel.

A-3.5 Re-extract the water layer one or more times, as may be found necessary, with a fresh 25-ml portion of the petroleum ether and wash with fresh 100-ml portions of water until the separated liquid is perfectly clear. An addition of a strong solution of salt may be found necessary.

A-3.4 Transfer the petroleum ether extract to a weighed evaporating dish of flask and evaporate to dryness. Dry at 103 ± 2°C for one hour, cool and weigh.

A.4. CALCULATION

A-4.1 Wax, percent by weight $= \frac{100\,w}{W}$

where

w = weight in g of the wax in the specimen, and

W = weight in g of the paper taken for the test.

APPENDIX B

(*Clause* 4.4)

DETERMINATION OF BENDING STRENGTH

B-1. APPARATUS

B-1.1 The apparatus shall be assembled as shown in Fig. 1.

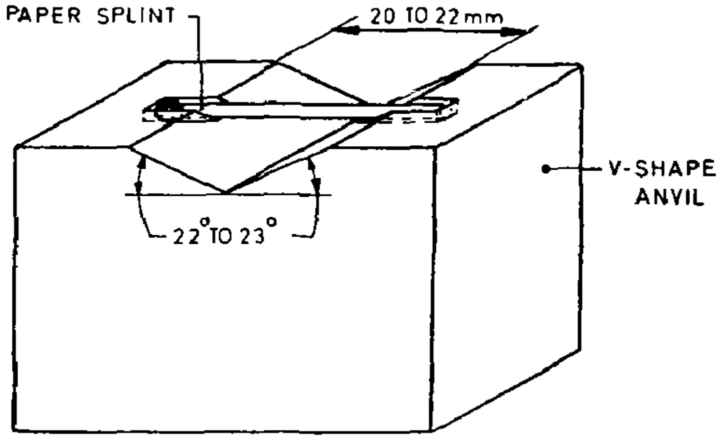

FIG. 1 DETERMINATION OF BENDING STRENGTH

B-2. PROCEDURE

B-2.1 Take wax-coated paper splints of prescribed length as per sampling plan. Place the splint on V-shaped anvil of any hard material as shown in Fig. 1. Apply vertically a gradually incieasing load on the centre of the splint between two arms of the anvil with the help of a steel wire of diameter of 2 ± 0 1 mm held across the splint till the splint bends through an angle of at least 45°. Repeat the test with other splints as well. The splints shall not bend under a load of less than 300 g.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITTY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	$1\ \text{N} = 1\ \text{kg m/s}^2$
Energy	joule	J	$1\ \text{J} = 1\ \text{N m}$
Power	watt	W	$1\ \text{W} = 1\ \text{J/s}$
Flux	weber	Wb	$1\ \text{Wb} = 1\ \text{V.s}$
Flux density	tesla	T	$1\ \text{T} = 1\ \text{Wb/m}^2$
Frequency	hertz	Hz	$1\ \text{Hz} = 1\ \text{c/s}\ (\text{s}^{-1})$
Electric conductance	siemens	S	$1\ \text{S} = 1\ \text{A/V}$
Electromotive force	volt	V	$1\ \text{V} = 1\ \text{W/A}$
Pressure, stress	pascal	Pa	$1\ \text{Pa} = 1\ \text{N/m}^2$

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 26 60 21, 27 01 31 Telegrams :Manaksansthа

Regional Offices :		Telephone
Western : Novelty Chambers, Grant Road	BOMBAY 400007	37 97 29
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